National Institute of Environmental Health Sciences

Who is more vulnerable to die from ozone air pollution?

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Abstract:

BACKGROUND: Daily increases in ambient ozone have been associated with increased mortality. However, little is known about which subpopulations are more susceptible to death related to ozone. METHODS: We conducted a case-only study in 48 US cities to identify subpopulations particularly vulnerable to ozone air pollution. Mortality and ozone data were obtained for the period 1989-2000 (May through September of each year) for 2,729,640 decedents. For each potential effect modifier, we fitted city-specific logistic regression models and pooled the results across all cities. Additionally, we examined differences in susceptibility factors according to several city characteristics using a meta-regression. RESULTS: For each 10 ppb increase in ozone (average of lags 0 to 2), people aged > or Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)65 years had a 1.10% (95% confidence interval Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.44% to 1.77%) additional increase in mortality (compared with younger ages). Other groups that were particularly susceptible were black people (additional 0.53% [0.19% to 0.87%]), women (additional 0.58% [0.18% to 0.98%]), and those with atrial fibrillation (additional 1.66% [0.03% to 3.32%]). Susceptibility factors had a larger effect in cities with lower ozone levels. For instance, the additional increase in ozone-related mortality for the elderly was 1.48% (0.81% to 2.15%) in a city with a mean ozone level of 42 ppb versus 0.45% (-0.27% to 1.19%) in a city with a level of 51 ppb. CONCLUSIONS: We confirmed the susceptibility of the elderly to die of ambient ozone and identified other vulnerable subpopulations including women, blacks, and those with atrial fibrillation. Differences in vulnerability were particularly marked in cities with lower ozone concentrations.

Source: Ask your librarian to help locate this item.

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Ozone

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Diabetes/Obesity, Respiratory Effect, Other Health Impact

Cardiovascular Effect: Stroke, Other Cardiovascular Effect

Cardiovascular Disease (other): atrial fibrillation; congestive heart failure; atherosclerosis

Respiratory Effect: Asthma, Chronic Obstructive Pulmonary Disease

Other Health Impact: inflammatory diseases

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: African-American

Other Vulnerable Population: women;those with atrial fibrillation

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified